Natural Gas.

PROF. ORTON.

Mr. Chairman, it seems as if I have had my day in court, this evening, but as the discussion seems to lag a little, may I be permitted to speak for a few moments upon the perpetuity, or otherwise, of the supply of gas in the natural gas fields of the State. This matter has a certain connection with coal, the interests of which are largely represented here. I have recently had occasion to go over the gas fields of Northern Ohio in part, and it seems to me that some rather important facts are coming to light in regard to the duration of the natural gas supply.

I would like to know what the feeling or information of others here is in regard to this subject, and what the influence upon the coal trade is likely to be.

The gas field of Northern Ohio was opened in November, 1884, by the drilling in of the first well at Findlay, and to the equal surprise, as we all confess, of the geologists and practical men. Nobody expected the result which was obtained. Very great development has gone forward in the two States of Ohio and Indiana. The people of Findlay were especially favored. They, however, did not reach their full supply until 1886, that is three years from the present time, when the Karg well was drilled at that point. Since that time they have had three years to develop the field, and some of the laws of exhaustion begin to appear. How far these wells drain the gas away has not yet become apparent, though I think there must be data accumulating which will soon enable that fact to be determined. But it is pretty clearly evident that a large well in the Findlay field, under the first head of pressure will exhaust itself if unrestrained in about three years time. Wells that have been tested for that period of time have, in a number of instances, gone out in the Findlay field, and also in the Bowling Green field.

We have perhaps some 250 square miles of gas producing territory in the State of Ohio, and we cannot tell whether the new wells are going to last as long as the old ones; we cannot tell how far the old ones drain the rock; but rock pressure is being reduced to some extent in the fields which have been operated. In some of the territory I found what was very cheering to know, the recognition of the fact that gas is a stored product. Findlay, fortunate as it has been, has been suffering from a very serious shortage in its town supply, and some of their manufacturing establishments have been obliged to shut down, and, on the whole, there has been quite a serious shortage there. I do not mean to say in

the whole field, but of gas within the city limits. The city lines have been extended, and some of their best wells are showing the sure signs of exhaustion and decrepitude, and of approaching death, being drowned out as such wells generally are, the pipes being filled with salt water.

The use that is being made of the gas for manufacturing purposes I think will have to be limited. It seems to me that natural gas is so happily adapted to domestic use that until our artificial gas producers are willing to supply us with a little cheaper product, so that we can have a luxury of that sort under our control, it ought to be kept in favored regions largely for that purpose.

There is one other interest to which I think natural gas is so happily adapted that it ought to be preserved for that purpose, and that is for manufacturing glass. So far as using it in iron manufacturers and in iron working and burning of clay and lime it seems to me that it is a profanation of one of the good gifts of the Creator to turn it to such uses as these. It is not adapted to it. It is adapted to giving most excellent results, but it is a waste of what will soon disappear, if iron working on a large scale is made dependent upon this product.

The Northwestern Ohio Gas Company, which is a very strong corporation, representing the wealth and sagacity of the Standard Oil Company, have constructed a pipe line for conveying the gas to Toledo, and they have one rolling mill upon their line, and that rolling mill consumes from thirty to fifty per cent. of all the gas which is conveyed from the natural gas fields to the city of Toledo. Before the gas reaches the city of Toledo, on the south bank of the river, the gas is depleted to that extent. It is not possible for any field to maintain iron working on a large scale. In many of the towns that have been so fortunate as to secure natural gas, they have offered free gas to manufacturers to induce them to locate. This is a most revolutionary feature, and certain towns have vied with each other in making liberal offers to such concerns, not only free gas, but also large subsidies to manufacturing companies; sometimes land, sometimes stock, and, in one case that I heard of, $50,000 of the bonds of the city for the company to come and locate a large glass manufacturing plant. This work is going forward, and the towns in the gas fields have had the idea that they can supply manufacturing concerns with free gas, or gas for $100 or $200 a year, but I think this is going to be changed in the course of a very few years, and that the coal trade will come to its rights again, and I think the uses to which natural gas are to be applied will be limited, and that this choice fuel will not be used for the working of iron, burning of clay and lime, etc.

Excuse me for breaking with a foreign subject, but I was rather sorry to see the moments of the meeting dragging heavily.

DISCUSSION OF PROF. ORTON'S PAPER.

Mr. Haseltine: What Prof. Orton has remarked as true of the Findlay field in regard to the exhaustion of gas it seems to me equally applicable to the fields of Western Pennsylvania. My attention was called to that a few weeks ago in making some investigation as to the quantity of coal that has been displaced by the use of gas in Ohio during the last year.

I found that in the sewer pipe and terra cotta works at Steubenville, which formerly used gas exclusively, where it was in abundance, have found that they were going to be short and that the supply was threatened to be exhausted very soon, and they have returned to the use of coal in every instance where they could, but have retained the gas in places where it was of the greatest value to them.

In Youngstown, every manufacturing establishment that has formerly used gas, on the first of October was shut off, some of them before that. But on the first of October they made a general raid on them and closed off everything that the pipe lines supposed to be adequate to supply the city and its manufacturers, were found now to be only adequate to furnish the supply for domestic use.

The rolling mills have never discovered a way in which to burn the gas economically. There is too much draft and no way to economize so that they have consumed a great deal more gas than was necessary to make the heat that was required.

The attention of natural gas men is now being turned to some way in which to utilize all the heat that is generated. In Western Pennsylvania the Washington gas field is failing so rapidly that those interested in it have become alarmed. I remember the McGorgin well was among the first that was discovered and burned for a great many years and lit up the surrounding country for thirty miles. It was not but a few weeks after they commenced tapping the wells in the vicinity until it was a failure and became filled with salt water. And in the southern and eastern part of the State if the supply decreases as rapidly in the next year as it has in the last, piping the gas outside of the towns immediately surrounding the gas fields will be a thing of the past. I do not think they will attempt to pipe gas thirty or forty miles.

Prof. Orton: I would like to ask Mr. Haseltine if he has made an estimate of the amount of coal displaced in Ohio.

Mr. Haseltine: Only partially. I have made inquiries of several of the manufacturers which burn large quantities of it and they have not returned their figures. The rolling mills have nearly all returned their estimates but the large potteries about Toronto have not sent me their figures, and other figures have not been

submitted to me, so that I am not able to give an accurate statement.

I will say this, that at Youngstown the amount of coal which will be displaced by gas will not be more than one-third as great as it was last year, and I think along the Ohio river it will drop probably nearly one-half; maybe not so much.

President Jennings: Mr. McMillin, what have you to say on the gas question?

Mr. Emerson McMillin: Mr. President, a few years ago when it was supposed that nobody knew very much about natural gas I was very fond of talking to the society about it, but now that you all are able to judge how little I knew upon the subject I am rather disposed to keep still. I am very "rusty" even in what I did gather up a few years ago. I am really sorry to hear that the coal men's prospects are growing. (Laughter). I would rather have natural gas than coal. I wish we could find more of it but I have no doubt of it myself, as Professor Orton remarked a while ago, that in a very few years the custom of giving free gas to manufacturers to induce them to locate in a town, will be abandoned. I think that is strictly true, for probably they will not be able to give them gas even at a high price, in a very few years.

I have had frequent opportunity of discussing the question of the lack of gas with parties controlling large manufacturing interests at Pittsburgh, and they have never concealed the fact there, that they thought the supply would be very short. There is of course two sides to the opinion that they may express. If their object was to sell stock they would want to make it appear that the gas might last forever, and if they wanted to get a better price for the gas it would be to their interest to show that it was being exhausted very rapidly. But gas men generally being regarded as strictly honest, I take their statement and assume that they are telling the truth. (Great laughter).

Mr. President, a gentleman back here interrupted me by his levity. (Renewed laughter).

Prof. Orton: Have they introduced meters? (Continued laughter).

Mr. McMillin: They are now using meters, yes. They used to do their lying with the tongue, but now they have gotten so far along as to do it by meter. (More laughter).

I would suggest that one of the great difficulties in using gas in iron manufacture is due to the fact that much of the gas must of necessity be wasted; and unless it could be used in recuperators, and this gas be utilized in this way, there necessarily has to be a very great loss. I believe it is a fact that the puddlers in Pittsburgh, and perhaps elsewhere, have refused to work in furnaces that use recuperators, and that being the case the loss in the

puddling furnaces must be very great, and more or less of a waste must exist in the heating furnaces that are not so constructed as to heat almost entirely by radiation rather than by contact. There would be more or less waste of iron to the puddlers if they had perfect combustion. Why the puddlers should object to using recuperators is a mystery I have never heard any explanation offered of, at all. I know in one furnace that was erected in Pittsburgh where recuperators were employed, and where they have been making experiments with fuel gas, it was very difficult to get them to use it long enough to test the gas. They would not operate the furnace at all. The work could be done much more rapidly and with as much ease as it could without them, but recuperators were regarded in some way as the enemy of the puddler and therefore they have not been introduced.

Mr. W. B. Hanlon: The Wheeling Natural Gas Company has experienced a great deal of difficulty with pressure, and within the last few weeks they have erected in the northern part of Bellaire a blower, in order to try to increase that pressure, but so far it has been a failure. It will draw the gas away from some part of the town, and still in the direction in which they force it, it does not want to give it pressure. They have made several tests of it and still it is a failure.

Mr. McMillin: I was very much afraid when the gentleman commenced talking about blowers that he was going to say they had succeeded. I took great pains a year ago in attempting to show you that they could not possibly succeed. I was trembling in my boots for fear I should be shown to be wrong. (Laughter).

Prof. Orton: I have heard that they were succeeding. That was what I was hoping to hear something about myself. I have heard that they were succeeding in the use of blowers in the Bradford Fields.

I know a company in Louisville, Kentucky, is basing great expectation on supplying Louisville with low pressure gas, gas that is not over 125 pounds rock pressure three miles away, and that they are depending on blowers to increase the pressure and claim that the thing has passed beyond the experimental stage and that it is a complete success, and instance Wellsburgh, Alleghany county, New York, and Cuba and perhaps Olean. I was hoping to hear something in regard to the matter from Mr. McMillin.

Mr. McMillin: It is a good deal like "trout fishing," a good ways off. (Laughter).